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AUTHOR Hayes, Donald S.; Clark, Judy
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ABSTRACT

The effect of stimulus familiarity on the comprehension of polar adjectives by preschool children was examined by administering a perceptual judgment task. The children's ability to indicate the correct object illustrating a particular word was assessed. Antonyms representing opposite dimensions of quantity, height, length, or size were presented. Although the overall level of performance was highly accurate, the number of correct responses varied significantly as a function of a word's polarity, and dimension tested, and the familiarity of the test objects. Even though preschoolers are usually reported to respond to the marked forms of polar adjectives as if they meant the same as the unmarked forms, such asymmetry in comprehension was found to be largest for the quantity dimension and to occur primarily on the unfamiliar test materials. The findings suggest that: (1) children's initial understanding of such terms may be situation specific; and (2) their asymmetry in performance may reflect a failure to apply existing cognitive structures in new situations. (Author/BW)

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Familiarity of Test Materials and Preschoolers' Comprehension of Polar Adjectives

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Donald S. Hayes and Judy Clark

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Abstract

This study was designed to examine the effect of stimulus familiarity on the comprehension of polar adjectives by preschool children. By administering a perceptual-judgment task, an assessment was made of children's ability to indicate the correct exemplar for polar adjectives representing the dimensions of quantity, height, length, or size. Although the overall level of performance was highly accurate, the number of correct responses varied significantly as a function of a word's polarity, the dimension tested, and the familiarity of the test materials. Even though preschoolers are usually reported to respond to the marked forms of polar adjectives as if they meant the same as the unmarked forms (cf. E. Clark, 1973), such asymmetry in comprehension was found to be largest for the quantity dimension and to occur primarily on the unfamiliar test materials. The findings were interpreted as suggesting that (a) children's initial understanding of such terms may be situation specific and (b) their asymmetry in performance may reflect a failure to apply existing cognitive structures in new situations.

Familiarity of Test Materials ans Preschoolers' Comprehension of Polar Adjectives[1]

Donald S. Hayes and Judy Clark

University of Maine

A number of studies in the last few years have been designed to assess young children's comprehension of polar adjectives (e.g., antonym pairs such as more-less, high-low, big-little, tall-short). Consistent findings in this literature have been that these terms are difficult for 3- to 5-year-old children to master and there is an asymmetry in the order in which "adultlike" meaning for the words is acquired (Brewer & Stone, 1975; Clark, 1972; Donaldson & Balfour, 1968; Palermo, 1973). Specifically the unmarked member of each pair (e.g., more) seems to be learned prior to the marked member (e.g., less). This asymmetry has been widely reported in two-choice perceptual judgment tasks in which preschoolers have been observed to make far more errors on the marked than on the unmarked adjective forms. The asymmetrical effect has also been shown to (a) occur with continuous as well as discreet materials (Palermo, 1973), (b) be independent of the frequency with which each polar form is used in the natural language (Klatzky, Clark, & Macken, 1973) and (c) occur under conditions where more than a single error choice is possible (Kavanaugh, 1976). Most importantly, the effect has been interpreted as reflecting a basic deficit, or asymmetry, in the semantic or cognitive structure of preschool children (E. Clark, 1973).

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[1] Draft of a paper presented at the 1977 meetings of the Eastern Psychological Association, Boston.

In certain commonplace situations, however, nursery-school children appear to be highly proficient at understanding both forms of such adjectives and in discriminating between their exemplars (e.g., in indicating which of two ice cream cones is smaller or which of two children is shortest). The important aspect of these apparent exceptions to the above findings may be that they reflect situations in which children use polar terms correctly with materials that are readily familiar to them.

Although no one to my knowledge has systematically assessed the effect of stimulus familiarity on children's comprehension of polar adjectives, Griffiths, Shantz, & Siegal (1967) used familiar objects (e.g., lollipops) as stimuli and found no marked asymmetry in 4-year-old's comprehension of such terms. Likewise, Beilin (1968) and Weiner (1974) have reported young children to be highly accurate in making more-less judgments when actual candy or toys are used as stimuli. It is also interesting to note that studies which have reported the largest asymmetry have tended to use materials that may be somewhat unfamiliar to young children (e.g., wooden dowels, cardboard apple trees, or cardboard cubes).

In order to clarify the mechanisms involved in children's acquisition of these terms and to examine whether 3-to-5-year-old children do have a basic deficiency in cognitive structure, we designed a study to assess the effect of stimulus familiarity on their comprehension of such adjectives. We thought that if the asymmetry in comprehension did vary as a function of the stimulus materials (e.g., was greater on unfamiliar than familiar objects), then it seems highly questionable to attribute any observed

asymmetrical effect solely to a deficit in cognitive structure. Instead, the asymmetry might also reflect a child's failure to apply an existing cognitive structure to new and unfamiliar materials.

Forty preschool children between three and five years of age were administered a two-choice perceptual judgment task. Sixteen trials were given in which the child was required to point to a requested exemplar from a pair of objects. The dimensions and polar adjectives tested were quantity (more-less), size (big-little), height (high-low) and length (tall-short). Eight sets of stimuli were constructed, with two sets representing each dimension. One set was judged by five preschool teachers to contain items highly familiar to young children. The other set for each dimension, the unfamiliar stimuli, contained materials identical to those used in one of two studies reporting the asymmetrical effect (Donaldson & Balfour, 1968; Klatzky, Clark & Macken, 1973). The unfamiliar versus familiar materials for the four dimensions were as follows: Quantity-two cardboard apple trees with 2 or 6 apples on each vs. two bowls of cooked spinach (one with 6 and the other with 18 ounces of spinach); Size--two orange cardboard cubes, with sides of 2.9 or 9.3 cm each vs. two pieces taken from a jigsaw puzzle with approximate surface areas of 12.8 cm^2 and 154.6 cm^2, respectively; Length--two strips of wood (one 7.3 cm and the other 144 cm tall) vs. the reflection of the child and a 5 foot 4 inch female experimenter as they stood back-to-back and looked into a wall mirror; and Height--two cardboard doors (one 15 and the other 3 cm high) vs. two shelves, one 8 cm and the other 144 cm above the floor. During testing, every dimension was assessed four times. Each reassessment of the

same dimension was separated by four intervening test trials. Four counterbalanced orders of testing different levels of familiarity and adjective polarity were administered.

Table 1 presents the percent of items to which the subjects correctly pointed according to dimension, stimulus materials, and the polarity of the adjective. The difference scores in the right column of Table 1 reflect the magnitude of the asymmetry in performance that was shown. The reliability of the trends in the Table was tested by a four-factor ANOVA, with polarity, dimension, and stimulus materials as within-subjects factors and sequence order a between-subjects variable. This analysis revealed a significant interaction of polarity with dimension ($p < .001$), which stemmed from the fact that only the dimensions of quantity and height produced significantly lower performance on the marked than unmarked adjectives. It is also apparent in Table 1 that very high levels of performance were obtained for the dimensions of size and length, with least accurate performance on the quantity dimension. As predicted, the interaction of polarity with materials was reliable ($p < .05$). Scheffe tests ($p = .05$) indicated that performance on the marked versus unmarked forms did not differ significantly when familiar test materials were used, but that there was a significant asymmetry in performance when the unfamiliar stimuli were administered. It is also apparent in Table 1 that the latter trend was most pronounced for the quantity dimension.

Two types of supplementary analysis were performed. First, it was determined that errors on the unfamiliar stimuli for the quantity dimension were not highly correlated within subjects (Tau = .06, $p < .25$) with errors on the familiar stimuli for the same dimension. Second, in order to determine whether any of the major findings varied as a function of age, data from the 13 youngest subjects (mean CA = 46.3 months) and the 13 oldest subjects (mean CA = 61.9 months) were entered in an additional analysis of variance. This analysis included age as a between-subjects variable and polarity, dimension, and materials as within-subjects factors. The main effect for age level was found to be unreliable ($p < .20$) and the factor did not enter into any significant interactions. Moreover, the significant main effects and interactions reported in the primary analysis were evident in the supplementary analysis as well. Thus, task performance did not appear to vary markedly as a function of age.

The major findings of this study are that preschool children showed: (a) highly accurate comprehension of polar adjectives representing the dimensions of size and length; (b) a general asymmetry in their comprehension of adjectives for quantity and height; and (c) variation in the magnitude of the asymmetry as a function of the familiarity of test materials employed.

The relatively high level of correct performance found for both the marked and unmarked forms on all dimensions except quantity was a surprising result. Similar findings have been reported for the size dimension (Brewer & Stone, 1975; Wales & Campbell, 1970), but correct

performance on the marked forms for the dimensions of height and length is usually reported to be lower than the levels found in this study (cf. Brewer & Stone, 1975; Palermo, 1973). This higher performance level may mean that children are mastering these terms at an earlier age than was true several years ago. The latter possibility gains some credence in view of the fact that programming for several popular television shows (e.g., Sesame Street) is devoted to teaching these concepts.

The most important finding of this investigation was that the degree of asymmetry varied as a function of stimulus materials. The significant polarity x materials interaction reflected the fact that the usual asymmetry in performance was reliably higher when subjects were tested with unfamiliar than with familiar materials. Parallel to this result was the finding of a low intra-subject correlation of errors made on familiar versus unfamiliar stimuli. These two findings are noteworthy for several reasons. First, they suggest that when young children are initially mastering the meaning of antonym pairs, the correct use of such adjectives may occur only in specific situations or with specific materials. Second, the findings suggest that the usual asymmetry in performance may stem from either a basic deficit in cognitive structure (cf. E. Clark, 1973) or from a child's failure to apply the appropriate cognitive structure at the proper time. Finally, the findings also appear to clarify why Griffiths et al. (1967) and Beilin (1968) found such highly accurate performance in young children's comprehension of polar adjectives, when many

other studies have not produced such results.

It is not readily apparent, however, why young children might correctly apply a cognitive structure only under certain conditions (e.g., with familiar material). It may be that labels for a particular dimension are initially learned in reference to only a limited number of specific exemplars and such labels have not yet been learned in reference to a larger class of objects. Alternatively, it may be that, because of inferior scanning of visual stimuli (cf. Vurpillot, 1968), young children do not perceive new or unfamiliar materials as representing different values along a particular dimension.

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Table 1

Percent of Adjectives Correctly Indicated According to Dimension, Materials and Polarity (N=40)

Dimension	Materials	Adjective Polarity		Difference Score
		Unmarked	Marked	
Quantity	Familiar	97.5	87.5	10.5
	Unfamiliar	97.5	60.0	37.5
Height	Familiar	97.5	95.0	2.3
	Unfamiliar	100.0	87.5	12.5
Length	Familiar	92.5	92.5	0
	Unfamiliar	95.0	87.5	7.5
Size	Familiar	100.0	100.0	0
	Unfamiliar	100.0	100.0	0